

Notice of Allowability

Application No.

10/645,584

Examiner

Nikolas J. Uhler

Applicant(s)

YOSHIDA ET AL.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 06/14/2004.
2. ☒ The allowed claim(s) is/are 23,25-27,29 and 31-33.
3. ☒ The drawings filed on 22 August 2003 are accepted by the Examiner.
4. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 09/811,471.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 09032004.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with John Mattingly on 09/03/2004.

The application has been amended as follows:

- **Claim 23, line 18:** "first perpendicular magnetic recording layer." has been deleted and -- first perpendicular magnetic recording layer, wherein: an exchange stiffness constant between grains of the first recording layer is 0.05×10^{-11} J/m or less; and an exchange stiffness constant between grains of the second recording layer is in a range of 0.15×10^{-11} J/m to 0.8×10^{-11} J/m; and further wherein: the first recording layer and the second recording layer are alternately laminated as multi-layers and the multi-layers include at least two of said first recording layers and at least two of said second recording layers. -- has been inserted therefor.
- **Claim 24 has been canceled.**
- **Claim 28 has been cancelled.**
- **Claim 29, line 20:** "thermal fluctuation are acquired." has been deleted and -- thermal fluctuation are acquired, wherein: an exchange stiffness constant between grains of the first recording layer is 0.05×10^{-11} J/m or less; and an exchange stiffness constant between grains of the second

recording layer is in a range of 0.15×10^{-11} J/m to 0.8×10^{-11} J/m; and further wherein: the first recording layer and the second recording layer are alternately laminated as multi-layers and the multi-layers include at least two of said first recording layers and at least two of said second recording layers. -- has been inserted therefor.

- **Claim 30 has been cancelled.**
- **Claim 34 has been cancelled.**

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: The following is an examiner's statement of reasons for allowance: The closest prior art to the instant invention US6428149 (applicants prior patent) and Japanese application #09-144835 to Futamoto et al.

3. Regarding applicants prior patent. The examiner notes that applicants prior patent contains claims to a magnetic recording medium having two magnetic layer, wherein the magnetic layers exhibit the exchange stiffness required by the claims. However, applicant's prior patent does not claim a magnetic recording medium utilizing at least to first magnetic layers and at least two second magnetic layers, wherein the first and second magnetic layers are alternately laminated as a multilayer, as required by all of the instant independent claims. While the advantages of utilizing multiple alternating magnetic layers in a magnetic recording medium are known, there is no teaching or suggestion in the art that applicants claimed exchange stiffness constants for the first and second recording layers is or can be maintained in a multilayer structure. Thus,

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applicant's requirement of multiple first magnetic layers and multiple second magnetic layers wherein the first and second magnetic layers exhibit specific exchange stiffness constants is considered to be a novel and non-obvious modification.

4. Futamoto discloses a perpendicular magnetic recording medium comprising a first magnetic layer having perpendicular magnetic anisotropy and a second magnetic layer having perpendicular anisotropy, wherein the magnitude of the exchange coupling constant (equivalent to the applicant's claimed exchange stiffness constant) between the grains of the second layer is greater than that of the first layer, Futamoto et al. fails to teach or render obvious the ranges required by claims for the exchange stiffness constant or the use of multiple first and second magnetic layers. There is no motivation to optimize the exchange-coupling constant of the magnetic layers in a magnetic recording medium having first and second magnetic layers, such that the first and second layers have exchange coupling constants that fall within the claimed ranges required by claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nikolas J. Uhler whose telephone number is

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571-272-1517. The examiner can normally be reached on Mon-Fri 7:30 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on 571-272-1535. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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PRIMARY EXAMINER